San Antonio, Bexar County, Texas
Cooperating Technical Partner
Mapping Activity Statement

Agreement #1- Hydrologic and Hydraulic Analyses and Floodplain Mapping

In accordance with the Cooperating Technical Partner (CTP) Memorandum of Agreement dated August 7, 2001, between CTP – City of San Antonio and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement is as follows:

1. **Objective and Scope:** The objective of this Mapping Activity is to develop detailed hydrologic and hydraulic analyses and floodplain and floodway mapping in Rosillo Creek. Hydrologic analyses will be completed for approximately 34.8 square miles of drainage area, and hydraulic analyses and floodplain mapping will be completed for approximately 17 linear miles of flooding, including the following flooding sources: Rosillo Creek.

2. **Period of Performance:** This Mapping Activity will begin in October 2001 and will be completed no later than October 2002. This Mapping Activity may be terminated at the option of FEMA or City of San Antonio in accordance with the provisions of the August 7, 2001, CTP Memorandum of Agreement.

   The period of performance will be in accordance with Agreement Article II.

3. **Funding/Cost-Sharing:**

4. **Standards:** The following standards and documents are relevant to this Mapping Activity: Detailed hydrologic and hydraulic analyses and floodplain mapping will follow the standards set forth in FEMA 37, *Guidelines and Specifications for Study Contractors* (January 1995), and Title 44 of the Code of Federal Regulations (CFR), Part 65. FEMA 37 is available at FEMA's Web site at http://www.fema.gov/mit/tsd/EN_reg.htm. Title 44 of the CFR is available at FEMA's Web site at www.access.gpo.gov/cgi-bin/cfrassemble.cgi?title=199944.
   - Computer models used for hydrologic and/or hydraulic analyses will meet the requirements of 44 CFR 65.6(a)(6) and be on FEMA's *Numerical Models Accepted by FEMA for NFIP* Usage (http://www.fema.gov/mit/tsd/EN modl.htm).
   - Topographic mapping used to delineate floodplains and floodways will be of adequate scale and topographic definition to provide reasonable accuracy. Planimetric features will be compatible with the base map (with respect to horizontal accuracy) selected by FEMA for Digital FIRM production. Topographic mapping taken from aerial photogrammetry or surveys will comply with the requirements of Appendix 4 of FEMA 37. The selection of the topographic mapping source to be used will be coordinated with the FEMA Regional Project Officer prior to analysis and mapping.

- Flood elevations and floodplain and floodway boundaries will reasonably tie in to non-revised information in accordance with 44 CFR 65.6(a)(2).
- The floodway will be established in accordance with 44CFR 65.7, as well as any applicable state and/or community requirements.
- Digital mapping will comply with the requirements of Chapter 9 and Appendix 7 of FEMA 37.
- Automated data processing and modeling algorithms for GIS-based modeling and mapping will be documented and provided to FEMA to ensure that they are consistent with the standards outlined above. Digital data sets (such as elevation, basin, or land use data) will be documented and provided to FEMA for approval prior to performing the analysis to ensure that they meet minimum requirements. If non-commercial (i.e., custom developed) software is used for the analysis, then full user documentation, technical algorithm documentation, and the software will be provided to FEMA for review prior to performing the scope of work.
- Digital Elevation Models (DEMs) and field survey data will meet vertical accuracy requirements contained in Appendix 4 of FEMA 37.

5. **Products:** City of San Antonio will make available items outlined in Chapter 11 of FEMA 37 in the Technical Support Data Notebook (TSDN) format. These include:
   - Digital 1% and 0.2% annual chance floodplain and floodway boundaries;
   - Digital profiles of the 10%, 2%, 1%, and 0.2% annual chance water-surface elevations, representing existing conditions;
   - Flood Insurance Study (FIS) report;
   - Floodway data tables;
   - Digital copies of all hydrologic and hydraulic modeling (input and output files) in HEC-1 and Hec-2 computer files; and
   - All back-up data used in the analyses or mapping.

   For GIS-based mapping, City of San Antonio will deliver all digital input and output data, intermediate data processing products, GIS data layers and final products in the format of the Digital Flood Insurance Rate Map (DFIRM) database structure.

6. **Schedule and Milestones:**

   Milestone 1 (Scoping Phase): Products for the first milestone to be provided to the FEMA Project Officer include:
   - Annotated copies of effective FIRMs depicting limits of proposed study.
   - Documentation of the proposed source of topographic data, scale, contour interval, source/methodology, date of survey/data collection, vertical and horizontal datums, and comparison of planimetric features with the DFIRM base map selected by FEMA for DFIRM production.
   - A written summary of the initial data research, proposed analysis methodologies, and a work plan.
   - Documentation of digital data sets to be used (such as elevation, basin, and land use data). Full user documentation, technical description of methodologies and algorithms,

and a copy of the source codes and custom-developed software applications for GIS-based modeling will also be provided.

- Copies of topographic maps depicting proposed cross section locations.

This milestone will be submitted no later than February 2002. The cost for this milestone is estimated to be $5,000 (Federal Share).

Milestone 2 (Hydrology Phase): Products for the second milestone to be provided to the FEMA Project Officer include draft hydrologic analyses in accordance with the TSDN format.

This milestone will be submitted no later than April 2002. The cost for this milestone is estimated to be $30,000 (Federal Share).

Milestone 3 (Hydraulics Phase): Products for the third milestone to be provided to the FEMA Project Officer include the hydraulic models and sample DFIRM floodplain mapping in accordance with TSDN format.

This milestone will be submitted no later than July 2002. The cost for this milestone is estimated to be $35,000 (Federal Share).

Milestone 4 (Final Products): Final products to be provided to the FEMA Project Officer include:

- The completed TSDN and accompanying data containing the information outlined in Section 5 of this Mapping Activity Statement.
- A QA/QC report documenting the results of the independent review of all computational and data processing procedures.

Final products will be made available in accordance with the Period of Performance described in Section 2 of this Mapping Activity Statement. The cost for this milestone is estimated to be $5,000. A total of $75,000 is estimated for this Mapping Activity Statement.

7. **Certification:** The following certifications apply to this Mapping Activity (as appropriate):
   - Hydrologic and/or hydraulic analyses and data will be certified by a registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.6(f).
   - Topographic information will be certified by a registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.5(c).

8. **Technical Assistance and Resources:** The City of San Antonio may obtain copies of FEMA-issued Letters of Map Change (LOMCs), archived engineering back-up data, and data collected as part of the Mapping Needs Assessment Process from FEMA's Mapping Coordination Contractor (MCC). The MCC may be contacted at 1-877 FEMA MAP (1-877-336-2627). General technical and programmatic information, such as FEMA 265, the Quick-2 computer program, and the MT-2 forms, can be downloaded from FEMA's Flood Hazard Mapping Web site (www.fema.gov./mit/tsd/). Specific technical and programmatic support may be provided through FEMA's MCC; such assistance should be requested through the FEMA MCC Project Officer specified in Section 12 of this Mapping Activity Statement.

The City of Antonio may also consult with the FEMA Project Officer to request support in the areas of selection of data sources, assessment of vertical data accuracy, data collection methods or sub-contractor, and GIS based engineering and modeling training.

9. **Contractors:** The City currently has a contract with HDR Engineering, Inc. D/B/A HDR/Simpson to provide professional engineering services on Rosillo Creek. The City proposes to use this engineering firm to continue mapping Rosillo Creek as part of this Mapping Activity. Procurement of this contractor using Federal funds provided as part of this Mapping Activity will comply with the requirements of 44 CFR 13.36.

10. **Quality Assurance/Quality Control (QA/QC) Procedures:** The City of San Antonio will undertake internal QC reviews to ensure that the products described under Section 5 of this Mapping Activity Statement conform with the standards outlined under Section 4 of this Mapping Activity Statement. Additionally, an independent review for compliance with these standards will be undertaken by FEMA's MCC.

11. **Reporting:** Reporting requirements will be in accordance with Agreement Articles V & VI.

12. **Points of Contact:** The FEMA Regional Project Officer is Jack B. Quarles, P.E., and the CTP Project Manager is Terrance Jackson, E.I.T. or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. If it is necessary, the assistance of FEMA's MCC should be requested through the FEMA MCC Project Officer, William Blanton, Jr.

Each party has caused this Mapping Activity Statement to be executed by its duly authorized representative.

Thomas G. Wendorf, P.E.
Director of Public Works
City of San Antonio, Texas
CTP Authorized Representative

8/30/01
Date

Jack B. Quarles, P.E.
Civil Engineer for Region 6
Federal Emergency Management Agency

9/7/01
Date

William Blanton, Jr.
FEMA MCC Project Officer

Date